IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION OF	)	
	)	GROUP NO.: 1771
RICHARD R. ROESLER ET AL	)	
	)	
SERIAL NUMBER: 10/663,826	)	
	)	
FILED: SEPTEMBER 16, 2003	)	
	)	
TITLE: PROCESS FOR PREPARING ASPARTATES	)	

DECLARATION OF RICHARD ROESLER UNDER 37 C.F.R. 1.132

I, Richard R. Roesler, hereby declare as follows:

1. I obtained my B. S. in Chemistry from Hamline University, St. Paul, Minnesota in 1965, and my Ph. D. in Physical-Organic Chemistry from the University of Washington, Seattle, Washington in 1969.

2. From 1986 to present I have been employed at Bayer Corporation, most recently as a Senior Principal Scientist with a focus on resin synthesis and product and process development of specialty urethane chemicals for the coatings, adhesives, sealants and elastomer markets. Previously I was a Development Specialist, Technical Manager, Research Scientist and Principal Scientist, also in the areas of specialty urethane chemicals for the coatings, elastomer and adhesive markets.

From 1969 to 1986 I served in various positions in the Polymer Division of Henkel Corporation, Minneapolis, Minnesota, including Technical Manager, Section Leader, Group Leader and Senior Research Chemist in the areas of synthesis and research of reactive intermediates, coatings, resins and polymers, and high molecular weight nylons.

3. I am an author of the publications listed in appendix A.

4. I am a named inventor on the patents listed in Appendix B and have an inventor's understanding of the patent system. I am a named inventor of the invention described in the captioned application, and as such am fully familiar with the subject matter therein.

5. Claims 1-10 of the current application are rejected as obvious and unpatentable over Squiller et al. (U.S. Patents 5,489,704 and 5,559,204) or Roesler (U.S. Patent 5,847,195), each in view of Cai (U.S. Patent 6,828,405) and Mormile et al. (U.S. Patent 5,214,086). It is my well considered opinion that the claims of the present application are not obvious in view of the references cited, alone or in combination, for the following reasons.

6. Aldimines and ketimines do not undergo the same mechanism of reaction when used in 2-component coating systems. As shown on page one of the attached table, ketimines undergo a hydrolysis reaction leading to release of ketone. The amine then reacts with the polyisocyanate to produce a polyurea. As previously explained, the reaction of a primary amine with a ketone to give an ketimine is an equilibrium reaction that lies only about 50% to the side of the product.

7. In contrast, an aldimine undergoes tautomerization, thus permitting the amine to react with the polyisocyanate. While aldimines undergo some hydrolysis, it is to a much lesser extent than ketimines, as evidenced by the data shown on page 2 of the table: at 3 days, there was still no evidence of hydrolysis in the aldimine-based coating, whereas the ketimine-based coating showed the presence of IPDA at only three hours. Overall the aldimine had less than 5% hydrolysis, while the ketimine had about 25% hydrolysis.

8. As also shown in the attached table, the ketimine-based composition is also more viscous: 80 mPas as compared to 25 mPas for the aldimine. This necessitates the use of additional solvent, which also increases VOCs.

9. The use of ketimines as compared to aldimines was regarded as undesirable because ketimines give off more volatile organic compounds and require use of additional solvent. One skilled in the art would not be motivated to substitute ketimines for aldimines in view of this problem. Cai and Mormile do not teach the equivalence of aldimines and ketimines in polyisocyanate-based systems, because one skilled in the art will recognize the hydrolysis problem with ketimines, especially in view of the fact that both Cai and Mormile disclose the mechanism of reaction of the imines with polyisocyanates.

9. It has been found that over time coating compositions based on aldimines slowly undergo hydrolysis and shrink, as evidenced by measurements on the weight loss of the coating over time (data unavailable). This is undesirable, as such shrinkage can cause cracks and other defects in the coating. The use of ketimines overcomes this problem, which was not appreciated until the present invention. It is my well reasoned opinion that Claims 1-10 are not obvious in view of the references cited, alone or in combination.

10. I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements are made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment or both under Section 1001 of Title 18 of the United States Cod, and the such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Richard R. Roesler

May 24, 2006
Date

APPENDIX A

Publications

- R. R. Roesler, invited columnist for series on statistically designed experimentation, "deSigns of the Times," Paint&Coatings Industry, fourteen articles published from January, 2000 to September, 2005.
- R. R. Roesler, "Statistically Designed Experimentation," FSCT symposium: Research Methods in the 21st Century: A Toolkit for Competitive Advantages, May, 2005
- R. R. Roesler, "High Throughput Experimentation Using Commonly Available Lab Equipment," FSCT symposium: Research Methods in the 21st Century: A Toolkit for Competitive Advantages, May, 2005
- R. R. Roesler, "Thermal stability of N-2-succinylaminoalkoxysilane based ureas" was presented at the 228th National Meeting of the American Chemical Society, Philadelphia, PA, August, 2004.
- Y. Berezkin, R. Roesler and P. Yu, "Development of Polyurethane Dispersion for Surgical Gloves Application," was presented at the International Latex Conference, Akron, Ohio, July, 2004
- R. R. Roesler and K. Danielmeier, "Tris-3-(1-aziridino)propionates and their use in formulated products." Progress in Organic Coatings (2004), 50(1), 1-27.
- C. Jansen and R. R. Roesler, "Dispercoll S Silica Sols for Water Based Adhesives," was presented at the Spring Convention of the Adhesive and Sealants Council, Cleveland, Ohio, April, 2004
- E. P. Squiller and R. Roesler, "Polyaspartics," Am. Chem. Soc. (2003), 225th POLY-365
- S. A. Grace and R. R. Roesler, "New developments in two-component, waterborne polyisocyanate-based coatings for automotive applications," Am. Chem. Soc. (2000), 220th PMSE-116; Polym. Mater. Sci. Eng. (2000), 83, 327-328
- R. R. Roesler, eleven articles published in the continuing series "Applied Statistics Simplified," American Paint and Coatings Journal, April, 1995 to February, 1999.
- P. R. Hergenrother and R. R. Roesler, "Paint and Protective Coating," Standard Handbook of Plant Engineering, R. S. Rosaler, Ed., Chap 18, pp 37–52.
- R. R. Roesler and P. R. Hergenrother, "Two-component polyurethane coatings," Journal of Coatings and Protective Linings, Jan, 1995, pp 83ff.
- S. Luthra and R. R. Roesler, "Resin Advances help spur VOC reductions, improve properties in polyurethane maintenance coatings," Paint & Coatings Industry, May, 1994, pp 44–49.

- R. R. Roesler and R. S. Dearth, "One component polyurethane coatings and sealants: innovative automotive applications," SAE International Congress and Exposition, Detroit, MI, Feb, 1991.
- R. R. Roesler, W. Cibulus and M. B. Bassi, "Polyurethanes: Low VOC Coatings for Concrete," SSPC91, Steel Structures Painting Council, Long Beach California, Nov, 1991.
- R. R. Roesler and R. W. Rumer, "Novel Waterborne Primer Surfacers,"
- R. R. Roesler and V. Mirgel, "Chip Resistant Coatings for the Automotive Industry," SAE International Congress and Exposition, Detroit, MI, Feb, 1989.
- R. R. Roesler, "An interpenetrating polymer network for high solids coatings," Waterborne and Higher Solids Coatings Symposium, New Orleans, LA, Feb, 1986.
- R. R. Roesler, "Using IPNs to formulate high-solids coatings," Modern Paint and Coatings (1986), 76(4), pp 46ff.

APPENDIX B

Patents

R. R. Roesler et al, thirty U.S. patent applications pending.

1. R. R. Roesler, P. B. Jacobs, D. Pethiyagoda, T. H. Riggio, M. M Salek and E. Yuhas, "Blocked isocyanate," U.S. 6894138, May 17, 2005
2. R. R. Roesler, D. L. Crawford, K. C. Frisch, K. M. Henderson and M. D. Strohecker, "Moisture-curable, polyether urethanes with reactive silane groups and their use as sealants, adhesives and coatings," U.S. 6,887,964, May 3, 2005
3. R. R. Roesler, D. L. Crawford, K. C. Frisch, D. Pethiyagoda, and K. Danielmeier, "Moisture-curable, polyether urethanes with reactive silane groups and their use as sealants, adhesives and coatings," U.S. 6,844,413, January 18, 2005
4. R. R. Roesler, D. L. Crawford, K. C. Frisch, K. Danielmeier and D. Pethiyagoda, "Moisture-curable, polyether urethanes with reactive silane groups and their use as sealants, adhesives and coatings," U.S. 6,833,423, December 21, 2004
5. R. R. Roesler, D. L. Crawford, K. C. Frisch, K. Danielmeier, D. Pethiyagoda and G. Ruttmann, "Moisture-curable, polyether urethanes with reactive silane groups and their use as sealants, adhesives and coatings," U.S. 6,809,170, October 26, 2004
6. K. Danielmeier, C. M. Britsch, R. Gertzmann, M. E. Vargo, T. D. Wayt, E. P Squiller and R. R. Roesler, "In-situ preparation of polyaspartic ester mixtures," U.S. 6,790,925, September, 14, 2004
7. R. R. Roesler, "Polyaspartic resins with good hardness and flexibility," U.S. 6,774,207, August 10, 2004
8. R. R. Roesler, "In-situ preparation of polyaspartic ester mixture," U.S. 6,737,500, May 18, 2004
9. R. R. Roesler, "In-situ preparation of polyaspartic ester mixture," U.S. 6,590,066, July 8, 2003
10. R. R. Roesler and E. P. Squiller, "Polyurea coatings from dimethyl-substituted polyaspartic ester mixtures," US 6,482,333, November 19, 2002
11. R. R. Roesler and E. P. Squiller, "Polyurea coatings from dimethyl-substituted polyaspartic ester mixtures," US 6,458,293, October 1, 2002
12. R. R. Roesler and P. R. Hergenrother, "Two-component coating compositions containing silane adhesion promoters," US 6,444,325, September 3, 2002
13. R. R. Roesler, L. K. Gindin and P. R. Hergenrother, "Aspartate-terminated urea/urethane prepolymers and their use I coating compositions," U.S. 6,355,829, March 12, 2002.

14. R. R. Roesler, P. R. Hergenrother, L. K. Gindin and E. P. Squiller "Coating composition containing polyisocyanate and aspartate-terminated urea/urethane prepolymer," U.S. 6,183,870, February 6, 2001

15. R. R. Roesler "Moisture-curable compositions containing isocyanate and succinyl urea groups," U.S. 6,180745, February 1, 2001

16. R. R. Roesler and M. W. Shaffer "Moisture-curable compositions containing polyisocyanates and polyacrylates having alkoxysilane groups," U.S. 6,169,140, January 2, 2001

17. R. R. Roesler "Moisture-curable compositions containing polyisocyanates and compounds with alkoxysilane groups," U.S. 6,114,436, September 5, 2000.

18. P. C. Yu, W. A. Corso, R. R. Roesler "Aqueous compounds containing alkoxysilane and/or silanol groups," U. S. 6,111,010, August 29, 2000

19. R. R. Roesler and L. Schmalstieg, "Moisture-curable compounds containing isocyanate and alkoxysilane groups," U. S. 6,077,902, June 20, 2000.

20. R. R. Roesler and L. K. Gindin, "Aqueous compositions containing mixtures of silane-functional resins," U. S. 6,007,901, June 20, 2000.

21. P. C. Yu, W. A. Corso, R. R. Roesler and J. R. Kleer "Aqueous compositions containing colloidal silica and compounds with alkoxysilane and/or silanol groups," U.S. 6,063,863, May 16, 2000.

22. R. R. Roesler, M. Shaffer, P. C. Yu and L. Schmalstieg, "Water dispersible polyisocyanates containing alkoxysilane groups," U.S. 6,057,415, May 2, 2000

23. R. R. Roesler and L. Schmalstieg "Silane-modified polyurethane resins, their preparation and use as moisture-curable resins for films and coatings," U.S. 6,046,270, April 4, 2000.

24. M. W. Shaffer, R. R. Roesler and L. Schmalstieg "Moisture-curable compounds containing isocyanate and alkoxysilane groups," U.S. 6,005,047, December 21, 1999.

25. R. R. Roesler and L. Schmalstieg, "Water dispersible compounds containing alkoxysilane groups, U.S. 5,952,445 September 14, 1999.

26. R. R. Roesler, P. Yu and L. Schmalstieg, "Aqueous two-component coating composition," U.S. 5,945,476, August 31, 1999.

27. R. R. Roesler, L. Schmalstieg and L. K. Gindin, "Aqueous polyurethane/urea dispersions containing alkoxysilane groups," U.S. 5,932,652, August 3, 1999

28. R. R. Roesler and L. K. Gindin "Aqueous polyurethane/urea dispersions containing alkoxysilane groups," U.S. patent 5,919,860, July 6, 1999.

29. R. R. Roesler, E. P. Squiller, P. E. Yeske and S. F. Siranovich, "Compounds containing urea and alkoxysilane groups," U.S. 5,908,948, June 1, 1999.

30. R. R. Roesler, L. Schmalstieg and L. K. Gindin, "Aqueous dispersions of polyurethane/ureas containing alkoxysilane groups and colloidal silicas," U.S. 5,859,118, January 12, 1999.

31. R. R. Roesler, "Process for the production of compounds containing aspartate and aldimine groups," U.S. 5,847,195, December 8, 1998.

32. L. Schmalstieg, R. Rettig, G. Limbeck, R. R. Roesler, E. P. Squiller, P. E Yeske and S. F. Siranovich, "Compounds containing alkoxysilane groups and hydantoin groups," U.S. 5,756,751, May 26, 1998.

33. P. B. Jacobs, T. A. Potter, R. R. Roesler, and R. W. Rumer, "Polyisocyanates containing allophanate and isocyanurate groups, a process for their production from a mixture of diisocyanates and their use in two-component coating compositions," US 5,258,482, Nov 2, 1993

34. R. S. Dearth, R. R. Roesler, N. H. Nodelman and P. D. Schmitt, "High solids, chip resistant polyurethane coating made from ketoxime blocked polyisocyanate and cyclohexane dicarboxylic acid polyester," US 5,202,406, Apr 13, 1993

R. R. Roesler, "Acrylic polyols having low residual monomer content," EP 197460, Oct 15, 1986

35. R. R. Roesler, "Adhesive bonding process, " US 4,363,689, Dec 14, 1982

36. J. E. Billigmeier, A. L. Melby, D. E. Peerman and R. Roesler, "Crosslinkable polyamides derived from polymeric fat acids," US 3,892,785, Jul 1, 1975